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In the event this product fails to operate under normal use, during the warranty period, due to defects in materials and workmanship, FOXWELL will, at its sole option, either repair or replace the product in accordance with the terms and conditions stipulated herein.

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Safety Information

For your own safety and the safety of others, and to prevent damage to the equipment and vehicles, read this manual thoroughly before operating your scanner. The safety messages presented below and throughout this user's manual are reminders to the operator to exercise extreme care when using this device. Always refer to and follow safety messages and test procedures provided by vehicle manufacturer. Read, understand and follow all safety messages and instructions in this manual.

Safety Message Conventions Used

We provide safety messages to help prevent personal injury and equipment damage. Below are signal words we used to indicate the hazard level in a condition.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

Important Safety Instructions

And always use your scanner as described in the user's manual, and follow all safety messages.

WARNING

- Do not route the test cable in a manner that would interfere with driving controls.
- Do not exceed voltage limits between inputs specified in this user's manual.
- Always wear ANSI approved goggles to protect your eyes from propelled objects as well as hot or caustic liquids.
- Fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris produced by a malfunction engine can cause serious injury or death. Do not use the scanner in areas where explosive vapor may collect, such as in below-ground pits, confined areas, or areas that are less than 18 inches (45 cm) above the floor.
- Do not smoke, strike a match, or cause a spark near the vehicle while testing and keep all sparks, heated items and open flames away from the battery and fuel / fuel vapors as they are highly flammable.
- Keep a dry chemical fire extinguisher suitable for gasoline, chemical and electrical fires in work area.
- Always be aware of rotating parts that move at high speed when an engine is running and keep a safe distance from these parts as well as other potentially moving objects to avoid serious injury.
- Do not touch engine components that get very hot when an engine is running to avoid severe burns.
- Block drive wheels before testing with engine running. Put the transmission in park (for automatic transmission) or neutral (for manual transmission). And never leave a running engine unattended.
- Do not wear jewelry or loose fitting clothing when working on engine.

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1 Using This Manual

We provide tool usage instructions in this manual. Below are the conventions we used in the manual.

1.1 Bold Text

Bold text is used to highlight selectable items such as buttons and menu options.

Example:

Press the **ENTER** button to select.

1.2 Symbols and Icons

1.2.1 Solid Spot

Operation tips and lists that apply to specific tool are introduced by a solid spot ●.

Example:

When System Setup is selected, a menu that lists all available options displays. Menu options include:

- Languages
- Unit
- Beep
- Keypad Test
- LCD Test
- About
- Shortcuts

1.2.2 Arrow Icon

▶ An arrow icon indicates a procedure.

Example:



To change menu language:

1. Scroll with the arrow keys to highlight **Language** on the menu.
2. Press the **ENTER** button to select.

1.2.3 Note and Important Message

Note

A NOTE provides helpful information such as additional explanations, tips, and comments.

Example:

NOTE

Test results do not necessarily indicate a faulty component or system.

Important

IMPORTANT indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

Example:

IMPORTANT

Do not soak keypad as water might find its way into the scanner.

2 Introduction

AUTOMASTER PRO series scanners from Foxwell are innovative diagnostic tools for most vehicles on the road today.

With the tool properly connected to the vehicle's data link connector (DLC), you can use the scanner to read diagnostic trouble codes and view "live" data readings from all electronic vehicle control systems, such as engine, ABS, and instrument cluster. You can also save "recordings" of the data readings, and print stored information.

2.1 Scanner Descriptions

This section illustrates external features, ports and connectors of the scanner.



Figure 2-1 Front View

- 1 **Diagnostic Port** - provides connection between vehicle and the scanner.
- 2 **LCD Display** - shows menus, test results and operation tips.
- 3 **Function Keys / Shortcut keys** - three keys that correspond with "buttons" on some screens for executing special commands or provide quick access to most frequently used applications or functions.
- 4 **Direction Keys** - select an option or scroll through a screen of data or text.
- 5 **ENTER Key** - executes a selected option and generally goes to the next screen.
- 6 **BACK Key** - exits a screen and generally returns to previous screen.
- 7 **HELP Key** - displays helpful information.
- 8 **Power Switch** - turns on/off the scanner and press and hold for 5 seconds for emergency reboots.
- 9 **SD Card Port** - holds the SD memory card for data backup and software update.

IMPORTANT

Do not use solvents such as alcohol to clean keypad or display. Use a mild nonabrasive detergent and a soft cotton cloth.

2.2 Accessory Descriptions

This section lists the accessories that go with the scanner. If you find any of the following items missing from your package, contact your local dealer for assistance.

- 1 **User's Guide** - provides operation instructions for the usage of the scanner.
- 2 **USB Cable** - provides connection between the scanner and a computer to upgrade the tool.
- 3 **Memory Card** - contains the scanner's operating software and applications.

IMPORTANT

Do not remove the memory card unless performing updates to the card.

- 4 **Diagnostic Cable** - provides connection between the scan tool and vehicle.
- 5 **Blower Molding Case** - stores the scanner and its accessories.

2.3 Technical Specifications

Display: Backlit, 480*272 TFT color display

Working Temperature: 0 to 60 °C (32 to 140°F)

Storage Temperature: -20 to 70°C (-4 to 158°F)

Power Supply: 8-18V vehicle power, 12V AC/DC power, 3.3V USB power

Dimensions (L*W*H): 200*130*40mm

Gross Weight: 1.8Kg

Protocols: SAE J1850 (VPW and PWM), ISO 9141-2, ISO 14230-2 (KWP 2000), ISO 15765-4 (CAN)

3 Getting Started

This section describes how to provide power to the scanner, provides brief introductions of applications loaded on the scanner and display screen layout and illustrates how to input text and numbers with the scan tool.

3.1 Providing Power to Scanner

Before using the scanner, make sure to provide power to the scanner.

The unit operates on any of the following sources:

- 12-volt vehicle power
- USB connection to personal computer

3.1.1 Connecting to Vehicle Power

The scanner normally powers on whenever it is connected to the data link connector (DLC).



To connect to vehicle power:

1. Locate the data link connector (DLC). The DLC is generally located under the dash on the driver side of the vehicle.
2. Attached the diagnostic cable to the scanner and tighten the captive screws to ensure good connection.
3. Connect a correct adapter to the data cable according to the vehicle being serviced and plug it into the vehicle DLC.

4. Switch the ignition key to the ON position.
5. The scanner automatically boots up.

IMPORTANT

Never try to provide power for the scan tool from USB connection when the scan tool is communicating with a vehicle.

3.1.2 Connecting to Personal Computer with USB Cable

The scan tool also receives power through the USB port when it is connected to a PC for updating software and transferring saved files.



To connect to PC:

1. Insert the small end of the USB cable to the USB port at the right side of the scanner and the large end to a computer.
2. Press the power switch of the scan tool to power it on.

3.2 Application Overview

When the scan tool boots up, the Home screen opens. This screen shows all applications loaded on the unit.

Following applications are preloaded into the scanner:

- **OBDII/EOBD** – leads to OBDII screens for all 9 generic OBD system tests.
- **Scan** – leads to screens for diagnostic trouble code information, live datastream, ECU information on 49 vehicle makes sold worldwide.
- **Setup** – leads to screens for adjusting default settings to meet your own preference and view information about the scanner.
- **Playback** – leads to screens for access saved data files.
- **Oil Reset** – leads to screens for resetting oil service light, oil inspection light, service mileage, service intervals and more .
- **EPB** – leads to screens for diagnostic trouble code information, live datastream, ECU information, special functions of electric parking brake systems.

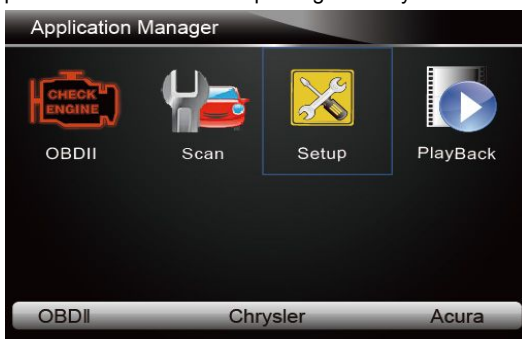


Figure 3-1 Sample Home Screen

3.3 Input Dialog Box

This section illustrates how to use the scan tool to input letters and numbers, such as VIN number, channel number, test values and DTC number. Typically, you may be required to input letters or numbers when you are doing any of the following operations.

- VIN entry
- input channel number
- set adaptation value

- enter block number
- enter login code
- key matching
- look up DTCs

The scan tool provides 4 different types of keyboard to meet your specific needs. Depending on the needs of text entry, it automatically shows the most suitable keypad.

- classic QWERTY keyboard for input of texts that contain both letters and numbers
- numeric keyboard for input of numbers
- alphabet keyboard for input of letters
- hexadecimal keyboard for special functions, such as key matching, UDS coding



To input text with the scan tool:

1. When you are requested to input text, press the function key **Keyboard**, and the keyboard displays.



Figure 3-2 Sample Input Text Screen

2. Scroll with the arrow keys to highlight your desired letter or number and press the **ENTER** key to confirm.

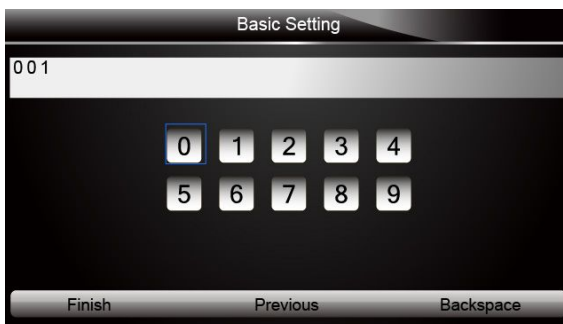


Figure 3-3 Sample Numeric Keyboard Screen

3. To delete a letter or number, use the function key **Previous** to move the cursor to it and then press the **Backspace** button.
4. When finished the entry, press **Finish** key to continue.

4 Diagnostic Operations

This section illustrates how to use the scanner to read and clear diagnostic trouble codes, and view “live” data readings and ECU information on controllers installed on the vehicles and also save “recordings” of the data readings.

4.1 Vehicle Identification

The vehicle identification information presented is provided by the ECM of the vehicle being tested. Therefore, certain attributes of the test vehicle must be entered into the scan tool to ensure the data displays correctly. The vehicle identification sequence is menu driven, you simply follow the screen prompts and make a series of choices. Each selection you make advances you to the next screen. A Back button in the upper left corner of the screen returns you to the previous screen. Exact procedures may vary somewhat by vehicle.

It typically identifies a vehicle by any of the following means:

- Automatic VIN acquisition
- Manual VIN entry
- Manual vehicle selection
- Vehicle data recorder

NOTE

Not all identification options listed above are applicable to all vehicles. Available options may vary by vehicle manufacturer.

4.1.1 Automatic VIN Acquisition

Automatic VIN Acquisition allows to identify a vehicle by automatically requesting the vehicle identification number (VIN).

- ▶ To identify a vehicle automatic VIN acquisition:
1. Scroll with the arrow keys to highlight **Scan** from the Application menu and press the **ENTER** key to start. If you have the application assigned to one of the function keys at the bottom of the screen, you can alternatively press the function key to start the application.



Figure 4-1 Sample Application Menu

2. A screen with vehicle manufacturer areas displays. Select the area where the vehicle manufacturer is from. A menu of all vehicle manufacturers from this area displays.



Figure 4-2 Sample Vehicle Manufacturer Area Selection Screen

3. Select the vehicle manufacturer. A list of vehicle identification options displays.



Figure 4-3 Sample Vehicle Manufacturer Selection Screen

4. Select **Vin acquisition** from the menu, and press the **ENTER** key.

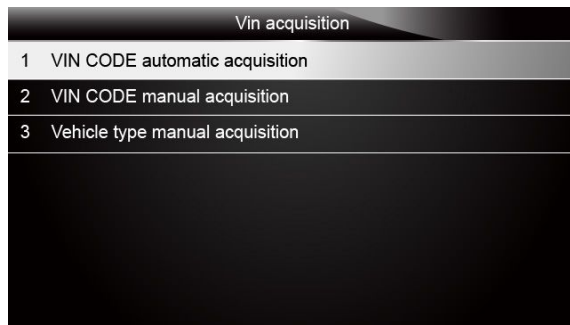


Figure 4-4 Sample Vin Acquisition Screen

5. The scan tool starts to communicate with the vehicle and read the Vehicle Specification or VIN Code automatically.

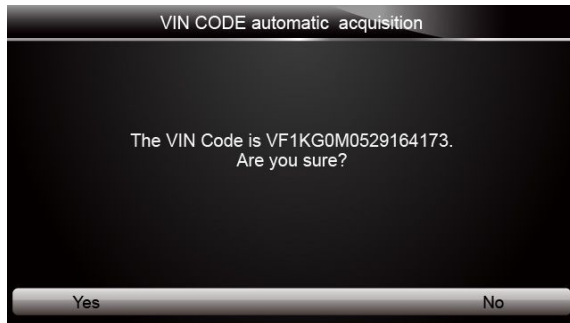


Figure 4-5 Sample VIN Automatic Acquisition

6. Answer **YES** if the Vehicle Specification or VIN code is correct and a menu of controller selection displays. Answer **NO** if it is incorrect, and you are required to enter the correct VIN number manually.

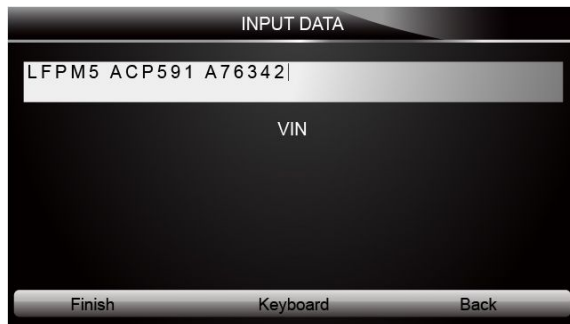


Figure 4-7 Sample manual VIN entry screen

4.1.2 Manual VIN Entry

Manual VIN Entry identifies a vehicle by manually inputting a 17-digit VIN code.



To identify a vehicle by manual VIN entry:

1. Refer to Step 1-3 of 4.1.1 Automatic VIN Acquisition.
2. Select a appropriate option from the menu. A virtual keyboard opens for VIN entry.



Figure 4-8 Sample Manual VIN Entry with Keyboard

3. Input a valid VIN code and use the function key **Finish** to confirm. The scan tool starts to identify the vehicle.

4.1.3 Manual Vehicle Selection

Manual Vehicle Selection identifies a vehicle by making several selections according to certain VIN characters, such as model year, and engine type.

- ▶ To identify a vehicle by manual vehicle selection:
1. Refer to Step 1-3 of 4.1.1 Automatic VIN Acquisition.
 2. On each screen that appears, select the correct option and then press the **ENTER** key. Do this until the complete vehicle information is entered and the menu of controller selection displays.

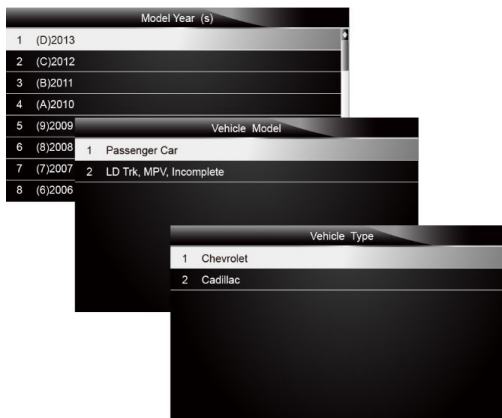


Figure 4.9 Sample Manual Vehicle Selection Screen

4.1.4 Vehicle Data Recorder

The scan tool is able to save a tested vehicle by creating a Vehicle Record. It provides quick identification of previously tested vehicle(s).

NOTE

The Vehicle Record option will not show if no record of previously identified vehicle is created.

- ▶ To create a vehicle record:
1. Identify the vehicle by any of the means above, and run an automatic system test by selecting **Auto Scan**.

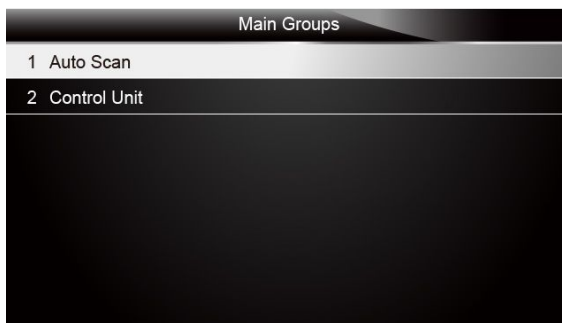


Figure 4-9 Sample System Menu Screen

- When the test finished, press the function key **Save** on the screen, and a screen with a QWERTY keyboard displays.



Figure 4-10 Sample Save Vehicle Record Screen

- Enter a unique name for this vehicle and save it, and you will see this new vehicle in Vehicle Data Recorder menu.

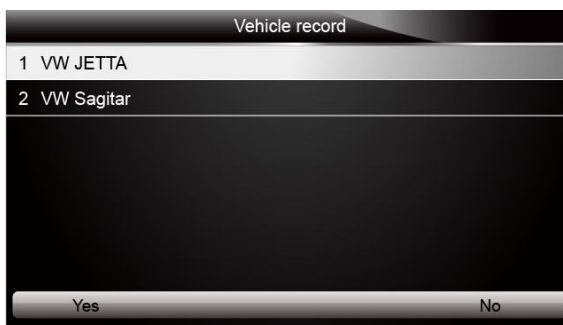


Figure 4-11 Sample Vehicle Record Screen



To identify a previously tested vehicle:

- Select **Vehicle record** and press the **ENTER** key to start.

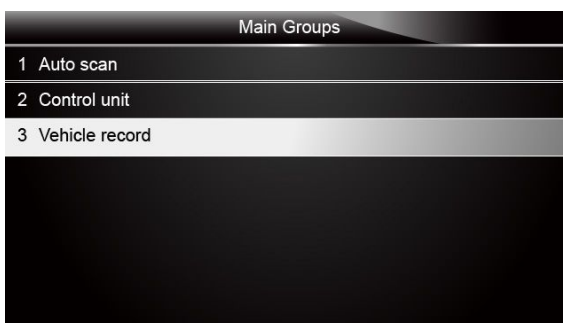


Figure 4-12 Sample tested vehicle identification screen

2. Select the vehicle under test and press the **ENTER** key.

4.2 System Selection

When you have completed the identification of vehicle, a menu for selecting system to test displays. Menu options typically include:

- Auto Scan
- Control Unit

4.2.1 Auto Scan

Auto Scan performs an automatic system test to determine which control modules are installed on the vehicle and obtain diagnostic trouble codes (DTCs) overview. Depending on the number of control modules, it may take a few minutes to complete the test.

-  To perform an automatic system scan:
1. Scroll with the arrow keys to highlight **Auto Scan** from the menu and press **ENTER** to start.

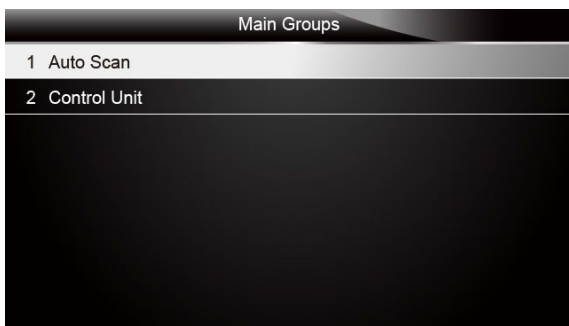


Figure 4-13 Sample Select System Scan Screen

2. To pause the scan, press the function key corresponding with **Pause** on the screen.



Figure 4-14 Sample Automatic system scan screen

3. At the end of successful automatic controller scan, a menu with a list of installed controllers together with their DTC overview displays.



Figure 4-15 Sample auto scan screen

4. If there is diagnostic trouble code(s) detected in a control unit, press the function key corresponding with **Display DTC** on the screen to view details of code information, and press the function key **Quick Erase** to clear them.

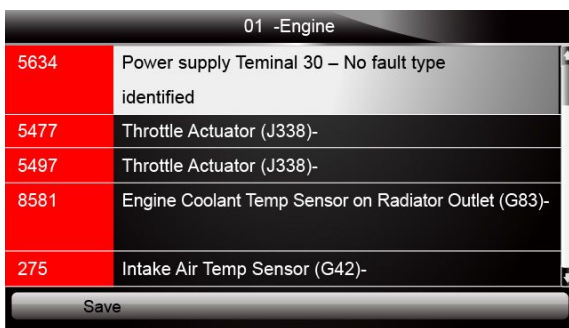


Figure 4-16 Sample Display DTC screen

5. Select the system you would like to test, and press the **ENTER** key. When the scanner has established connection with the vehicle, the Function Menu displays.

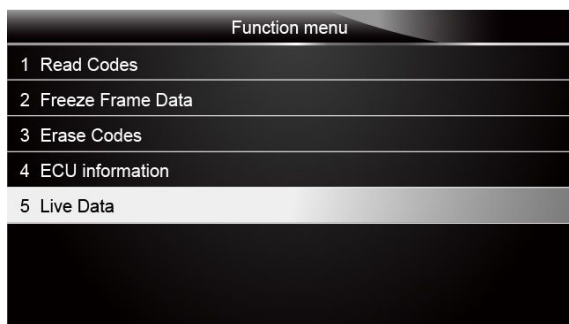


Figure 4-17 Sample Function Menu screen

4.2.2 Control Unit

Control Unit screen displays all controllers available of the vehicle manufacturer. The controllers listed on the menu do not mean that they are installed on the vehicle.

- ▶ To select a system for testing:
1. Scroll with the arrow keys to highlight **Control Unit** from the menu and press the **ENTER** key. A controller menu displays.

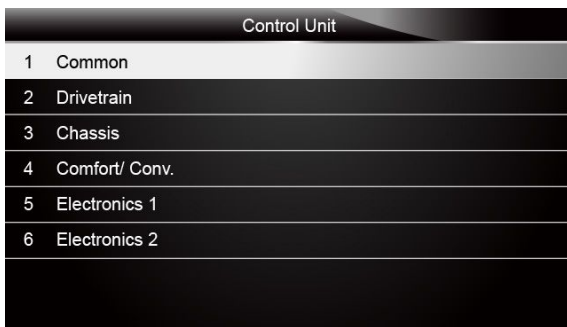


Figure 4-18 Sample Control Unit Menu Screen

2. Select the system you would like to test. When the scanner has established connection with the vehicle, the Function Menu displays.

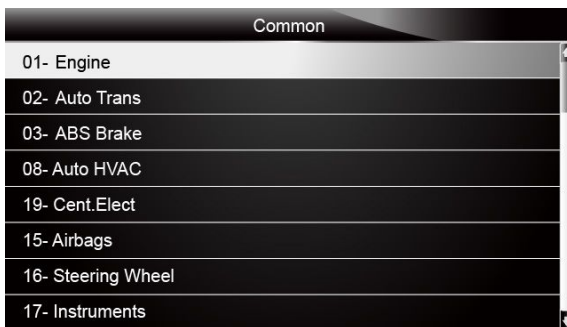


Figure 4-19 Sample Common menu screen

4.3 Diagnostic Function Selection

After a system is selected and the scanner establishes communication with the vehicle, the Function Menu displays. The menu options may include:

- Read Codes
- Freeze Frame Data
- Erase Codes
- ECU Information
- Live Data

NOTE

Not all function options listed above are applicable to all vehicles. Available options may vary by the year, model, and make of the test vehicle. A "The selected mode is not supported!" message displays if the option is not applicable to the vehicle under test.

4.3.1 Read Codes

Read Codes menu lets you read trouble codes found in the control unit. Typical menu options include:

- Present/Permanent/Current Codes
- Pending Codes
- History Codes
- Code History
- Self Diagnostic


Present/Permanent/Current codes stored in a control module are used to help identify the cause of a trouble or troubles with a vehicle. These codes have occurred a specific number of times and indicate a problem that requires repair.

Pending codes are also referred to as maturing codes that indicate intermittent faults. If the fault does not occur within a certain number of drive cycles (depending on vehicle), the code clears from memory. If a fault occurs a specific number of times, the code matures into a DTC and the MIL illuminates or blinks.

History codes are also referred to as past codes that indicate intermittent DTCs that are not currently active.

Code history is number of engine starts since DTC(s) were first detected (to see if they are current or intermittent)

Self diagnostic lets you manually activate system tests that check for DTCs. Usually it includes a KOEO (Key-on, engine-off) test and a KOER (key-on, engine-running) test.

-  To read codes from a vehicle:
1. Scroll with the arrow keys to highlight **Read Codes** from Function Menu and press the **ENTER** key. A code list including code number and its description displays.

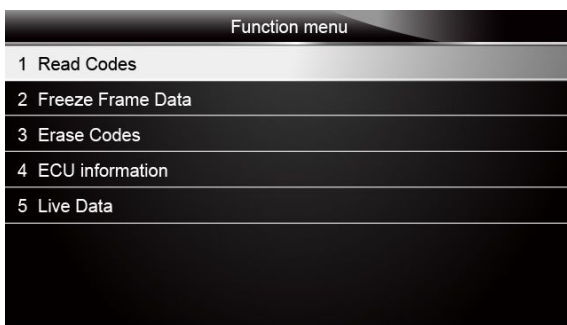


Figure 4-20 Sample Function menu screen

2. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.

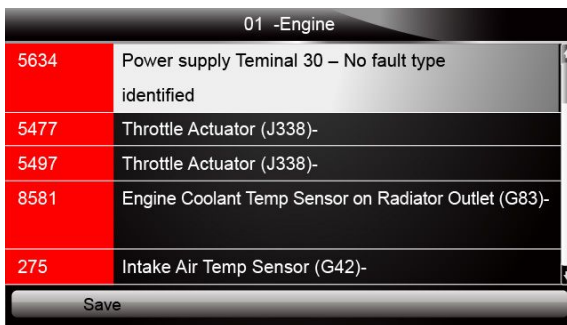


Figure 4.21 Sample Code Screen

3. Press function key **Save** to store DTC information. Or use the **BACK** key to exit.

4.3.2 Freeze Frame Data

Freeze Frame Data menu displays freeze frame data, a snapshot of critical vehicle operating conditions automatically recorded by the on-board computer at the time of the DTC set. It is a good function to help determine what caused the fault.



To view freeze frame data:

1. Select **Freeze Frame Data** from the Function Menu. Details of freeze frame data displays.

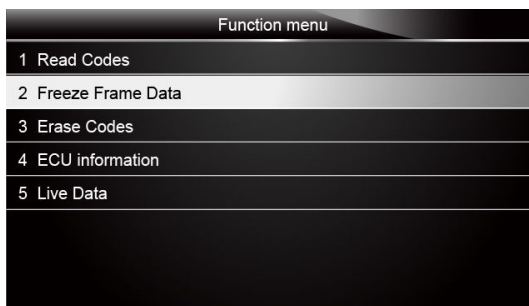


Figure 4-22 Sample function menu screen

2. Use the arrow keys to scroll back and forth through different screens of data.

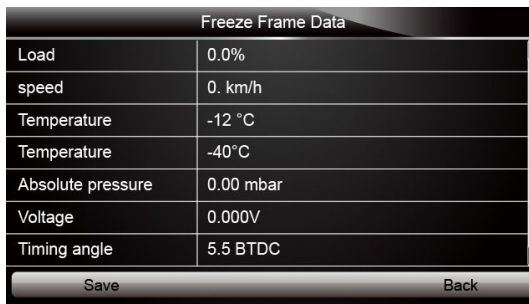


Figure 4-22 Sample Freeze Data screen

3. Press function key **Save** to store freeze frame information. Or use the **BACK** key to exit.

4.3.3 Erase Codes

Erase Codes menu lets you to clear all current and stored DTCs from a selected control module. Also it erases all temporary ECU information, including freeze frame. So make sure that the selected system are completely checked and serviced by technicians and no vital information will be lost before clearing codes.

NOTE

- To clear codes, make sure that the ignition key is switched to ON with the engine off.
- Erase Codes does not fix the problem that caused the fault! DTCs should only be erased after correcting the condition(s) that caused them.



To clear codes:

1. Scroll with the arrow keys to highlight **Erase Codes** from Function Menu and press the **ENTER** key.

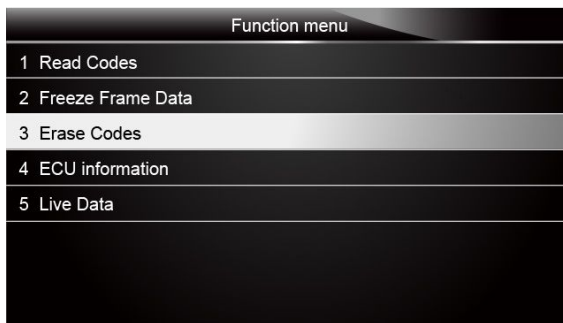


Figure 4-23 Sample Function Menu Screen

2. Follow the on-screen instructions and answer questions about the vehicle being tested to complete the procedure.

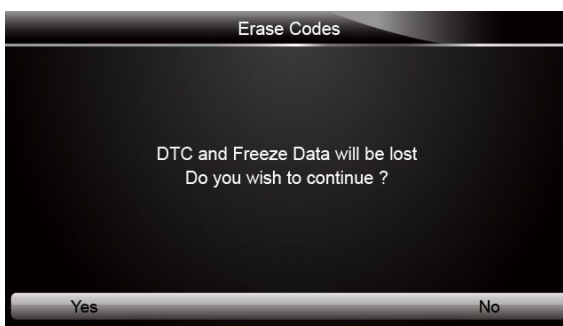


Figure 4-24 Sample Erase Codes Screen

3. Check the codes again. If any codes remain, repeat the Erase Codes steps.

4.3.4 ECU Information

ECU Information screen displays the identification data of the control module under test, such as the control module identification string and the control module coding.



To read ECU information:

1. Select **ECU Information** from the menu and press the **ENTER** key.

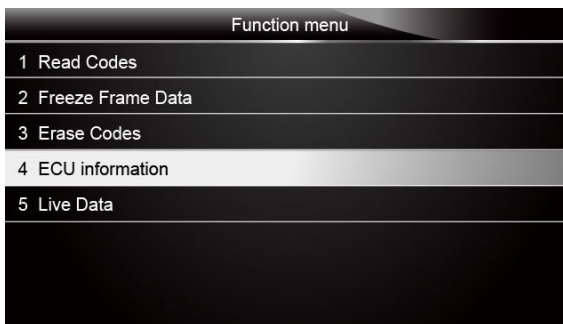


Figure 4-25 Sample Function Menu Screen

2. A screen with detailed information of the selected control module displays.

ECU Information	
VAG Number	1K0907115A
Component	2.0IR4/4 VTFSIG000050
WSC	00046
IMP	00412
Device	0000
Save Back	

Figure 4-26 Sample ECU Information Screen

3. Press function key **Save** to store ECU information. Or use the **BACK** key to exit.

4.3.5 Live Data

Live Data menu lets you view and record real time PID data from a selected vehicle electronic control module.

Menu options typically include:

- Complete Data List
- Custom Data List

4.3.5.1 Complete Data List

Complete Data List menu lets you view all live PID data from a selected system.



To view all live PID data

1. Scroll with the arrow keys to highlight **Live Data** from the menu and press the **ENTER** key to display the live data menu.

Live Data	
1	Complete List
2	Custom List

Figure 4-27 Sample Live Data Selection Screen

2. Select the **Complete List** from the menu and press the **ENTER** key to display the datastream screen.

Complete List		
ENGINE SPEED	0	rpm
VEHICLE SPEED SENSOR	11	mph
ABSOLUTE THROTTLE POS.	0.4	%
SHIFT LEVER SWITCH	PN	
BATTERY VOLTAGE	0.1	V
WHEEL SPD SENSOR-FL	1	mph
<div> <div>Pause</div> <div>One Graphic</div> <div>Save</div> </div>		

Figure 4-28 Sample Complete List Screen

3. Scroll with the up and down arrow keys to highlight a line, if the **One Graphic** on the bottom is highlighted, it indicates the graphing is available for the selected line. Press the function key **One Graphic** to display the PID graph.

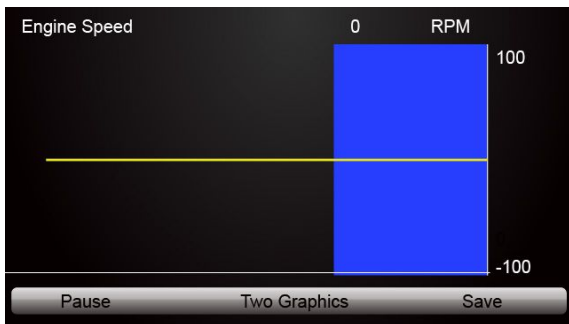


Figure 4-29 Sample PID graph Screen

4. Press the function key **Two Graphics** to display two PID graphs in one screen.

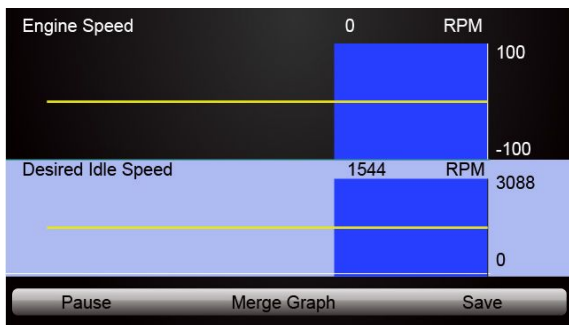


Figure 4-30 Sample Two PID Graph Screen

5. Press the function key **Merge Graph** to display two PID plots in one coordinate for easy and intuitive diagnosis.

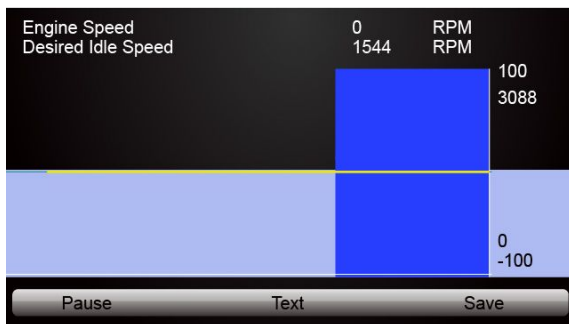


Figure 4-31 Sample Merged PID Plots Screen

6. To record the data to memory of the scanner, use the function key **SAVE**, and press **Stop Saving** to stop recording at any time.
7. Press **Text** to return to text viewing of PID data.
8. Select **Pause** to suspend collecting data from the scanner and use the **Start** key to resume collecting data.
9. Press the **Back** key to return to the previous menu.

4.3.5.2 Custom Data List

Custom Data List menu lets you to minimize the number of PIDs on the data list and focus on any suspicious or symptom-specific data parameters.



To create a custom data list:

1. Select **Custom List** from the menu and press the **ENTER** key.

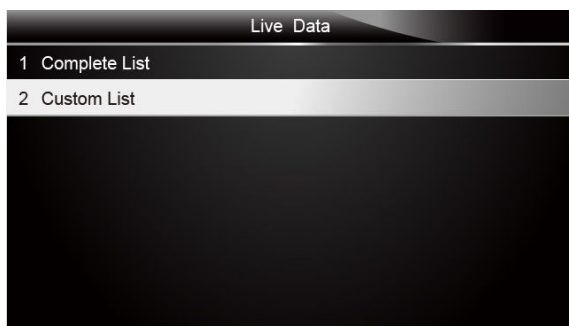


Figure 4-32 Sample Live Data Screen

2. The custom datastream selection screen displays. Scroll with the up and down arrow keys to highlight a line, press the **ENTER** key and then repeat the action to make more selections.



Figure 4-33 Sample Custom List Selection Screen

NOTE

To deselect an item, select it again and then press the **ENTER** key. Alternatively, use the function keys **SELECT ALL** and **CLEAR ALL** to select or deselect all items at once.

- When finished selection, use the function key **VIEW DATA** to display selected items.

Custom List		
Voltage Supply	12.032	V
Engine Speed	0	/min
Ignition, Timing Angle	0.0	°BTDC
Throttle Drive, Angle Sensor 1	99.6	%
Intake Air Mass	0.00	g/s
Engine Speed	0	/min

Figure 4-34 Sample Datastream Screen

5 OBDII/EOBD Operations

OBD-II/EOBD menu lets you access all OBD service modes. According to ISO 9141-2, ISO 14230-4, and SAE J1850 standards, the OBD application is divided into several sub programs, called 'Service \$xx'. Below is a list of OBD diagnostic services:

- **Service \$01** - request current powertrain diagnostic data
- **Service \$02** - request powertrain freeze frame data
- **Service \$03** - request emission-related diagnostic trouble codes
- **Service \$04** - clear/reset emission-related diagnostic information
- **Service \$05** - request oxygen sensor monitoring test results
- **Service \$06** - request on-board monitoring test results for specific monitored systems
- **Service \$07** - request emission-related diagnostic trouble codes detected during current or last completed driving cycle
- **Service \$08** - request control of on-board system, test or component
- **Service \$09** - request Vehicle Information

When OBDII/EOBD application is selected from Home screen, the scanner starts to detect the communication protocol automatically. Once the connection has established, a menu that lists all of the tests available on the identified vehicle displays. Menu options typically include:

- System Status

- Read Codes
- Freeze Frame Data
- Erase Codes
- Live Data
- I/M Readiness
- O2 Sensor Test
- On-board Monitor Test
- Component Test
- Vehicle Information
- Modules Present
- Code Lookup

NOTE

Not all function options listed above are applicable to all vehicles. Available options may vary by the year, model, and make of the test vehicle. A “The selected mode is not supported!” message displays if the option is not applicable to the vehicle under test.

5.1 System Status

System Status option open a screen with a summary of system status of the vehicle under test.



To view summary system status of a vehicle:

1. Scroll with the arrow keys to highlight **System Status** from Diagnostic Menu and press the **ENTER** key.

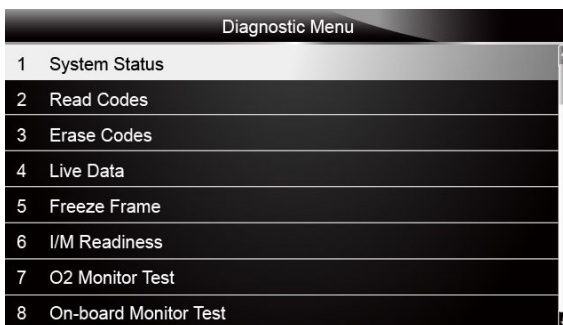


Figure 5-1 Sample Diagnostic Menu Screen

2. A screen with detailed information displays.

System Status		
MIL Status	OFF	
Code Found	0	
Monitors N/A	OFF	
Monitors OK	3	
Monitors INC	3	

Figure 5-2 Sample System Status Screen

5.2 Read Codes

Read Codes menu lets you read both stored codes and pending codes found in the control unit. Typical menu options include:

- Stored Codes
- Pending Codes

Diagnostic trouble codes stored in a control module are used to help identify the cause of a trouble or troubles with a vehicle. These codes have occurred a specific number of times and indicate a problem that requires repair.

Pending codes are also referred to as maturing codes that indicate intermittent faults. If the fault does not occur within a certain number of drive cycles (depending on vehicle), the code clears from memory. If a fault occurs a specific number of times, the code matures into a DTC and the MIL illuminates or blinks.



To read codes/pending codes from a vehicle:

1. Scroll with the arrow keys to highlight **Read Codes** from Diagnostic Menu and press the **ENTER** key.

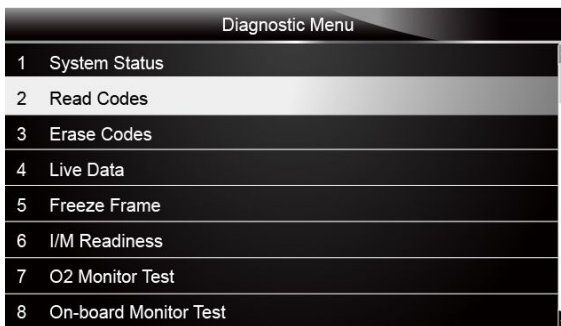


Figure 5-3 Sample Diagnostic Menu Screen

2. Select **Stored Codes/Pending Codes** and press the **ENTER** key to confirm. A code list including code number and its description displays.

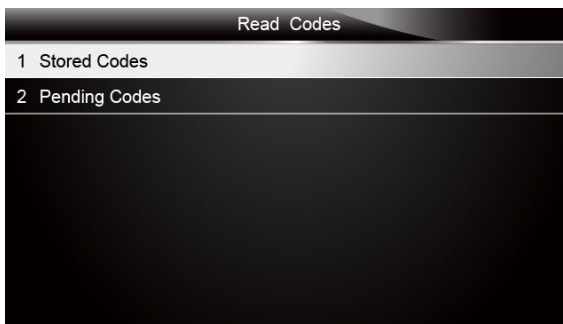


Figure 5-4 Sample Read Codes Screen

If no DTCs are present the message “No (Pending) Codes Found!” is displayed. If any manufacturer specific or enhanced codes detected, select vehicle a make before viewing DTC information.



Figure 5-5 Sample No Codes Screen

3. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.

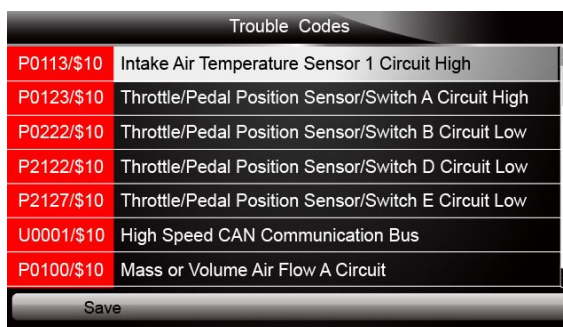


Figure 5-6 Sample Code screen

4. Press function key **Save** to store DTC information. Or use the **BACK** key to exit.

5.3 Erase Codes

Erase Codes menu lets you to clear all current and stored DTCs from the control module. Also it erases all temporary ECU information, including freeze frame. So make sure that the selected system are completely checked and serviced by technicians and no vital information will be lost before clearing codes.

NOTE

- To clear codes, make sure that the ignition key is switched to ON with the engine off.
- Erase Codes does not fix the problem that caused the fault! DTCs should only be erased after correcting the condition(s) that caused them.



To clear codes:

1. Scroll with the arrow keys to highlight **Erase Codes** from Diagnostic Menu and press the **ENTER** key.

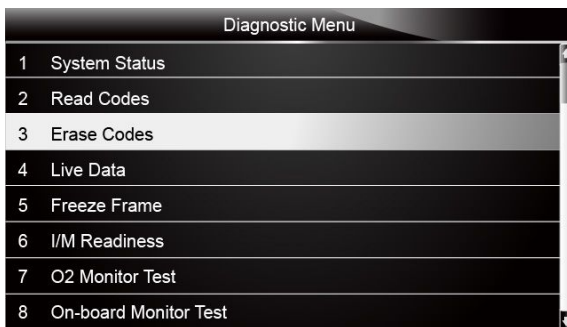


Figure 5-7 Sample Diagnostic Menu Screen

2. Follow the on-screen instructions and answer questions about the vehicle being tested to complete the procedure.

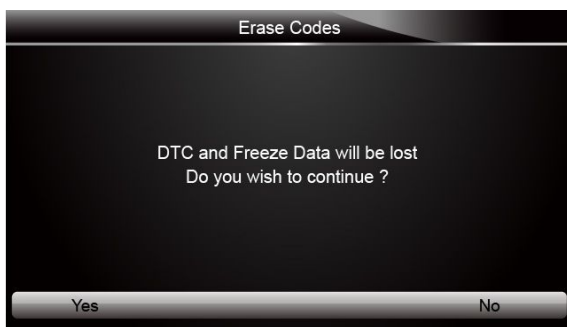


Figure 5-8 Sample Erase Codes Screen

3. Check the codes again. If any codes remain, repeat the Erase Codes steps.

5.4 Live Data

Live Data menu lets you view and record real time PID data from the electronic control module.

Menu options typically include:

- Complete Data List
- Custom Data List

5.4.1 Complete Data List

Complete Data List menu lets you view all live PID data from a selected system.

- ▶ To view all live PID data:
1. Scroll with the arrow keys to highlight **Live Data** from Diagnostic Menu and press the **ENTER** key.

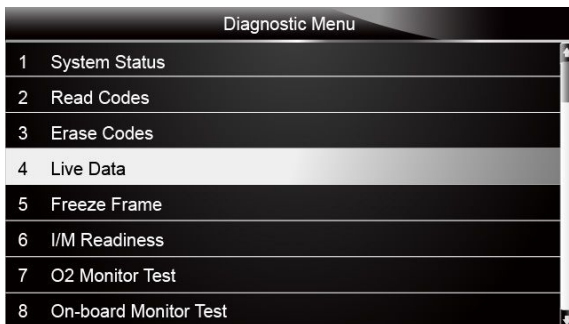


Figure 5-9 Sample Diagnostic Menu Screen

2. Select **Complete List** from the menu and press the **ENTER** key to display the datastream screen

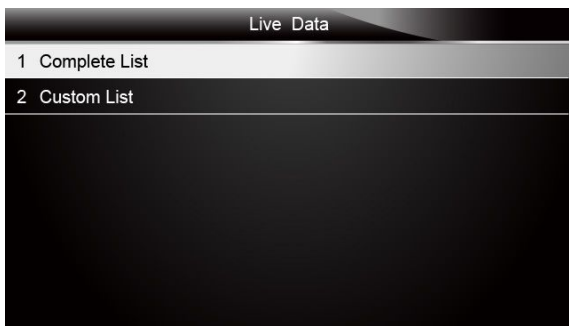


Figure 5-10 Sample Live Data Menu Screen

3. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.

Complete List		
Number of DTCs	0	
Fuel Systems 1 Status	OL	
Fuel Systems2 Status	--	
Calculate load value	0.0	%
Engine Coolant Temperature	57	°F
Short Term Fuel Trim-Bank 1	0.0	%
<div> <div>Pause</div> <div>One Graphic</div> <div>Save</div> </div>		

Figure 5-11 Sample Complete List Screen

4. Scroll with the up and down arrow keys to highlight a line, if the **One Graphic** on the bottom is highlighted, it indicates the graphing is available for the selected line. Press the function key **One Graphic** to display the PID graph.

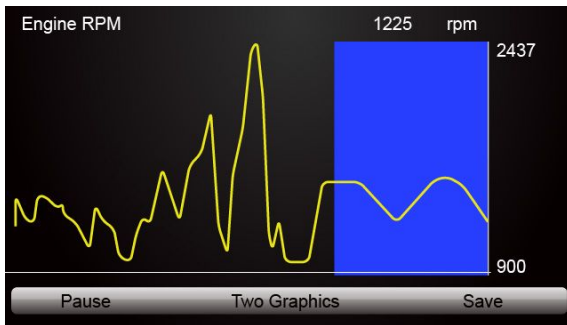


Figure 5-12 Sample PID Graph Screen

5. Press the function key **Two Graphics** to display two PID graphs in one screen

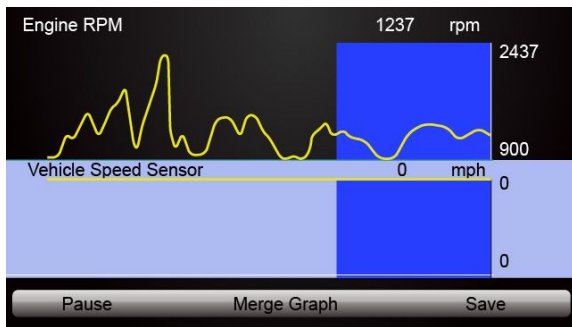


Figure 5-13 Sample Two PID Graph Screen

6. Press the function key **Merge Graph** to display two PID plots in one coordinate for easy and intuitive diagnosis.



Figure 5-14 Sample Merge Graph Screen

7. To record the data to memory of the scanner, use the function key **SAVE**, and press **Stop Saving** to stop recording at any time.
8. Select **Text** to return to text viewing of PID data.
9. Press **Pause** to suspend collecting data and use the **Start** key to resume collecting data.
10. Use the **Back** key to return to diagnostic menu.

5.4.2 Custom Data List

Custom Data List menu lets you to minimize the number of PIDs on the data list and focus on any suspicious or symptom-specific data parameters.

- 
- To create a custom data list:
1. Select **Custom List** from the menu and press the **ENTER** key.

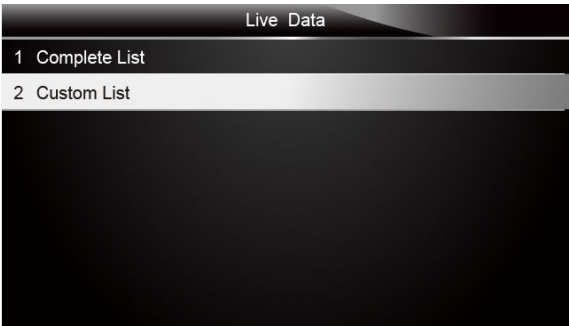


Figure 5-15 Sample Live Data Menu Screen

2. The custom datastream selection screen displays. Scroll with the up and down arrow keys to highlight a line, press the **ENTER** key and then repeat the action to make more selections.

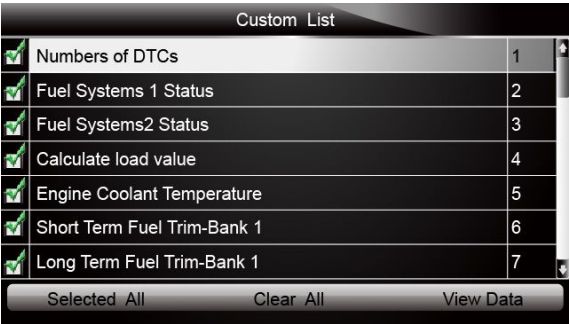


Figure 5-16 Sample Custom Datastream Selection Screen

NOTE
To deselect an item, select it again and then press the **ENTER** key. Alternatively, use the function keys **SELECT ALL** and **CLEAR ALL** to select or deselect all items at once.

3. When finished selection, use the function key **VIEW DATA** to display selected items.

Custom List		
Number of DTCs	0	
Fuel Systems 1 Status	OL	
Fuel Systems2 Status	--	
Calculate load value	0.0	%
Engine Coolant Temperature	57	°F
Short Term Fuel Trim-Bank 1	0.0	%
<div> <div>Pause</div> <div>One Graphic</div> <div>Save</div> </div>		

Figure 5-17 Sample Datastream Screen

5.5 Freeze Frame

Freeze Frame menu displays freeze frame data, a snapshot of critical vehicle operating conditions automatically recorded by the on-board computer at the time of the DTC set. It is a good function to help determine what caused the fault.



To view freeze frame data:

1. Select **Freeze Frame** from the Diagnostic Menu. Details of freeze frame data displays.

Diagnostic Menu	
1	System Status
2	Read Codes
3	Erase Codes
4	Live Data
5	Freeze Frame
6	I/M Readiness
7	O2 Monitor Test
8	On-board Monitor Test

Figure 5-18 Sample Diagnostic Menu Screen

2. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data. If no freeze frame detected, the message "No freeze frame data stored!" is displayed.

Freeze Frame Data	
Load	0.0%
speed	0. km/h
Temperature	-12 °C
Temperature	-40°C
Absolute pressure	0.00 mbar
Voltage	0.000V
Timing angle	5.5 BTDC
<div> <div>Save</div> <div>Back</div> </div>	

Figure 5-19 Sample Freeze Data Screen

3. Press function key **Save** to store freeze frame information. Or use the **BACK** key to exit.

5.6 Read I/M Readiness Status Data

I/M Readiness option allows to view a snapshot of the operations for the emission system on OBDII/EOBD vehicles.

I/M Readiness is a useful function used to check if all monitors are OK or N/A. The vehicle's computer performs tests on the emission system during normal driving conditions. After a specific amount of drive time (each monitor has specific driving conditions and time required), the computer's monitors decide if the vehicles emission system is working correctly.

When the monitor's status is:

- OK - vehicle was driven enough to complete the monitor.
- INC (Incomplete) - vehicle was not driven enough to complete the monitor.
- N/A (Not Applicable) - vehicle does not support that monitor.

There are two types of I/M Readiness tests:

- Since DTCs Cleared - shows status of the monitors since the DTCs were last cleared.
- This Drive Cycle - shows status of monitors since the start of the current drive cycle.

Below is a list of abbreviations and names of OBD II monitors supported by the scanner.

No.	Abbreviation	Name
1	Misfire Monitor	Misfire Monitor
2	Fuel System Mon	Fuel System Monitor
3	Comp. Component	Comprehensive Components Monitor
4	Catalyst Mon	Catalyst Monitor
5	Htd Catalyst	Heated Catalyst Monitor
6	Evap System Mon	Evaporative System Monitor
7	Sec Air System	Secondary Air System Monitor
8	A/C Refrig Mon	Air Conditioning Refrigerant Monitor
9	Oxygen Sens Mon	Oxygen Sensor Monitor
10	Oxygen Sens Htr	Oxygen Sensor Heater Monitor
11	EGR System Mon	Exhaust Gas Recirculation System Monitor

NOTE

- To review I/M Readiness status, make sure that the ignition key is switched to ON with the engine off.
 - Not all monitors are supported by all vehicles.
-



To retrieve I/M Readiness Status data:

1. Scroll with the arrow keys to highlight **I/M Readiness** from Diagnostic Menu and press the **ENTER** key. If vehicle supports both types of monitors, a screen for monitor type selection displays. Select a monitor type and press the **ENTER** key.

Diagnostic Menu	
1	System Status
2	Read Codes
3	Erase Codes
4	Live Data
5	Freeze Frame
6	I/M Readiness
7	O2 Monitor Test
8	On-board Monitor Test

Figure 5-20 Sample Diagnostic Menu Screen

2. Depending on readiness test, one of these 2 screens will be present. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.

Since DTCs cleared		
Malfunction Indicator lamp(MIL) Status	OFF	
Misfire Monitoring	OK	
Fuel system Monitoring	OK	
Comprehensive component Monitoring	OK	
Catalyst Monitoring	INC	
Heated Catalyst Monitoring	N/A	
Evaporative system Monitoring	INC	
Secondary air system Monitoring	N/A	

Figure 5-21 Sample IM Readiness Screen 1

Or

This Drive Cycle		
Malfunction Indicator lamp(MIL) Status	OFF	
Misfire Monitoring	OK	
Fuel system Monitoring	OK	
Comprehensive component Monitoring	OK	
Catalyst Monitoring	INC	
Heated Catalyst Monitoring	N/A	
Evaporative system Monitoring	INC	
Secondary air system Monitoring	N/A	

Figure 5-22 Sample IM readiness screen 2

3. Press the **BACK** key to exit.

5.7 O2 Monitor Test

OBD II regulations require certain vehicles monitor and test oxygen (O2) sensors to isolate fuel and emissions related faults. The O2 Monitor Test function is used to retrieve completed O2 sensors monitor test results.

The O2 Monitor Test is not an on-demand test. O2 sensors are not tested when selected via the menu but tested when engine operating conditions are within specified limits.

If the vehicle uses a controller area network (CAN) protocol to communicate, this function is not supported by vehicle. Refer to “On-Board Monitor Tests” on page 38-39 for O2 monitor data of CAN-equipped vehicles.



To retrieve O2 monitor data:

1. Scroll with the arrow keys to highlight **O2 Monitor Test** from Diagnostic Menu and press the **ENTER** key. A screen with a list of available sensors displays.

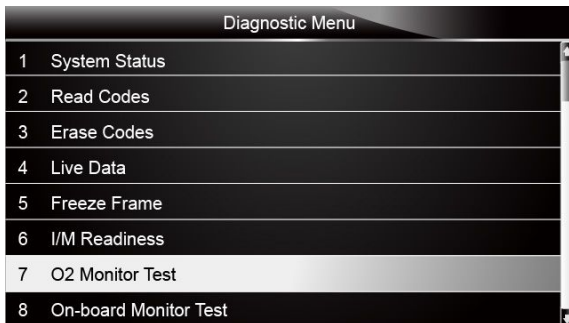


Figure 5-23 Sample Diagnostic Menu Screen

2. Scroll with the arrow keys to highlight an O2 sensor and press the **ENTER** key to confirm. A screen with details of the selected sensor displays.

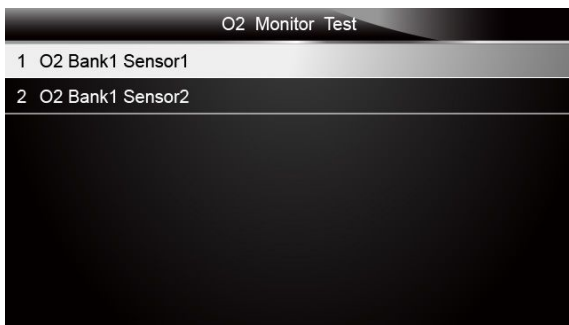


Figure 5-24 Sample O2 Monitor Test screen

3. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.



Figure 5-25 Sample O2 Bank1 Sensor 1 Screen

4. Press **Enter** key to view data of selection.

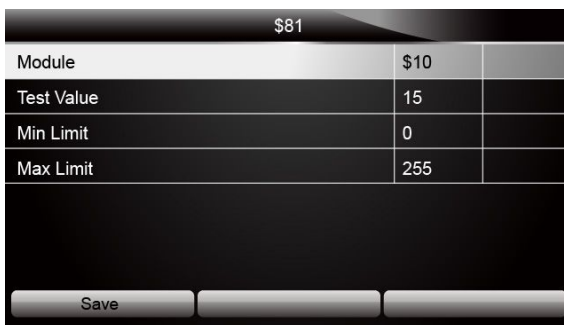


Figure 5-26 Sample data of \$81 screen

5. Press the **BACK** key to exit and return.

5.8 On-Board Monitor Test

The On-Board Monitor Test function is useful after servicing or after clearing a vehicle ECU's memory. It receives test results for emission-related powertrain components and systems that are not continuously monitored for Non-CAN vehicles. And for CAN vehicles, it receives test data for emission-related powertrain components and systems that are and are not continuously monitored. It is vehicle manufacturer who is responsible for assigning test and component IDs.

NOTE

Test results do not necessarily indicate a faulty component or system.



To request on-board monitor test results:

1. Scroll with the arrow keys to highlight **On-Board Monitor Test** from Diagnostic Menu and press the **ENTER** key.

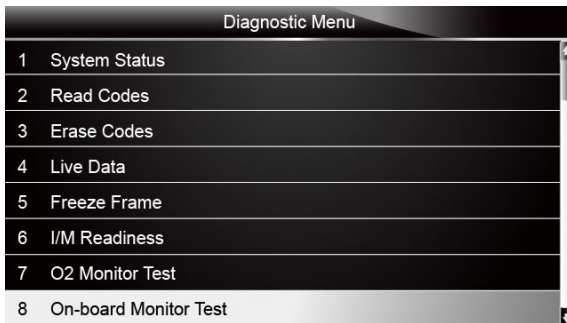


Figure 5-27 Sample Diagnostic Menu Screen

2. Depending on the protocol the vehicle used, one of these 2 screens shows.

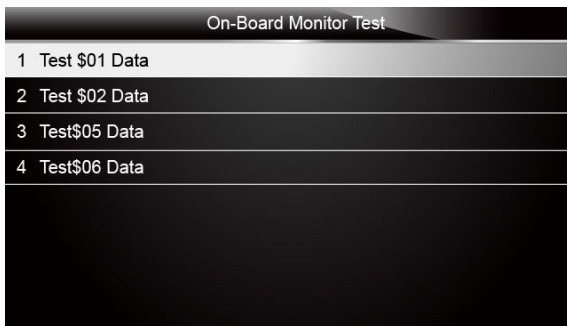


Figure 5-28 Sample Non-CAN Vehicle Test Screen

Or

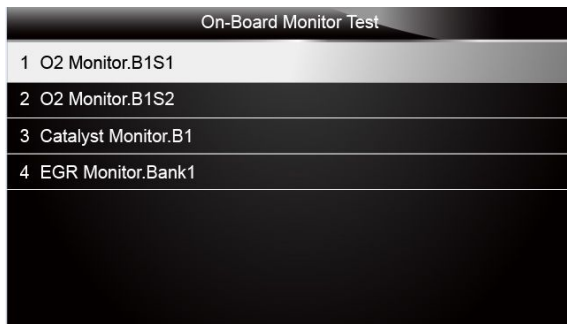


Figure 5-29 Sample CAN vehicle test screen

3. Scroll with the arrow keys to highlight a test group and press the **ENTER** key to confirm. A screen with details of the selected sensor displays. Use the up and down arrow keys to scroll through data to select lines, and left and right arrow keys to scroll back and forth through different screens of data.

For non-CAN vehicles, test screen is illustrated as below:

Test \$01 Data		
ID	00	
Module	\$10	
Test Value	0000	
Min Limit		
Max Limit	0000	
Status	OK	

Figure 5-30 Sample Non-CAN vehicle test screen

For CAN vehicles, test screen is illustrated as below:

Test \$01 Data		
MEAS	0.450	
MIN	0.312	
MAX	0.630	
STS	OK	

Figure 5-31 Sample Can vehicle test screen

4. Press the **BACK** key to exit and return.

5.9 Component Test

Component Test allows the scanner to control operation of vehicle components, tests or systems.

NOTE

- Some manufacturers do not allow tools to control vehicle systems.
- The manufacturer sets the criteria to automatically stop test. Refer to appropriate vehicle service manual before using this function.



To perform a component test:

1. Scroll with the arrow keys to highlight **Component Test** from Diagnostic Menu and press the **ENTER** key. A screen with a list of available tests displays.

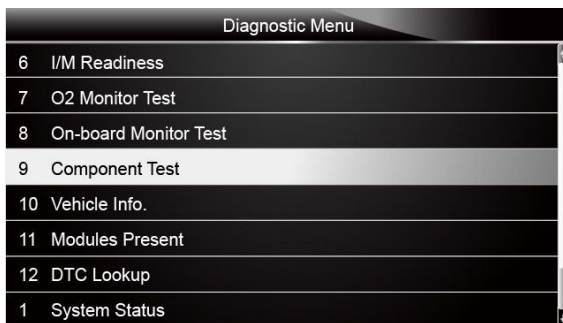


Figure 5-32 Sample Diagnostic Menu Screen

2. Scroll with the arrow keys to highlight a system or component, press the **ENTER** key to start test and the scanner displays the message "Command Sent!".

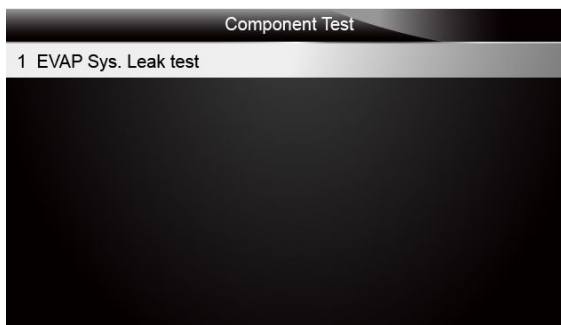


Figure 5-33 Sample Component test screen

3. Press the **BACK** key to exit and return.

5.10 Request Vehicle Information

Vehicle Information allows to request the vehicle's VIN number, calibration ID(s) which identifies software version in vehicle control module(s), calibration verification numbers (CVN(s)) and in-use performance tracking on model year 2000 and newer OBD II compliant vehicles.

CVNs are calculated values required by OBD II regulations. They are reported to check if emission-related calibrations have been changed. Multiple CVNs may be reported for a control module. It may take several minutes to do the CVN calculation. In-use performance tracking tracks performance of key readiness monitors.

NOTE

Available options will vary depending on the vehicle under test.



To request vehicle information:

1. Scroll with the arrow keys to highlight **Vehicle Info.** from Diagnostic Menu and press the **ENTER** key.

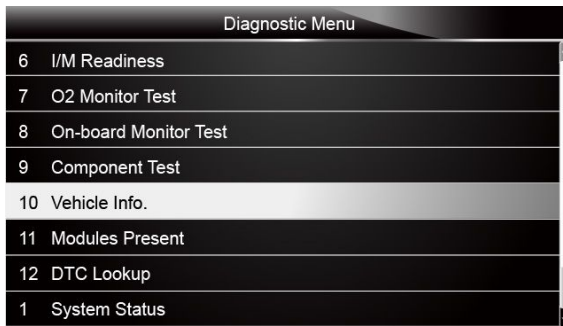


Figure 5-34 Sample Diagnostic Menu Screen

2. Follow on-screen instruction and send the command to read vehicle information. A screen with a list of available options displays.

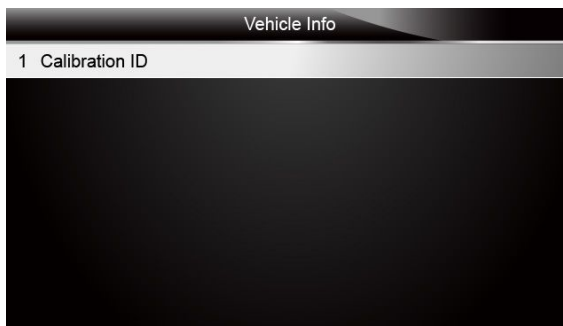


Figure 5-35 Sample Vehicle Info Screen

3. Scroll with the arrow keys to highlight an available option and press the **ENTER** key. A screen with details of the selected option displays.

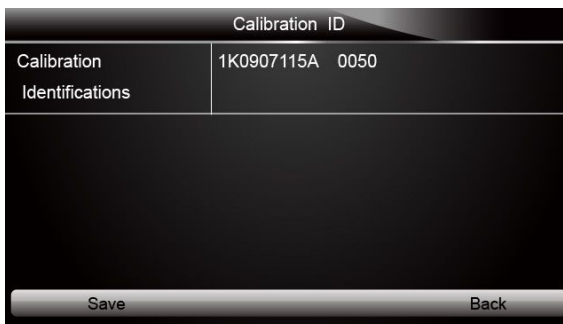


Figure 5-36 Sample Calibration ID Screen

4. Press function key **Save** to store the readiness data. Or use the **BACK** key to exit and return.

5.11 Modules Present

The scanner identifies module IDs and communication protocols for OBD2 modules in the vehicle.



To view module IDs and communication types:

1. Scroll with the arrow keys to highlight **Modules Present** from Diagnostic Menu and press the **ENTER** key.

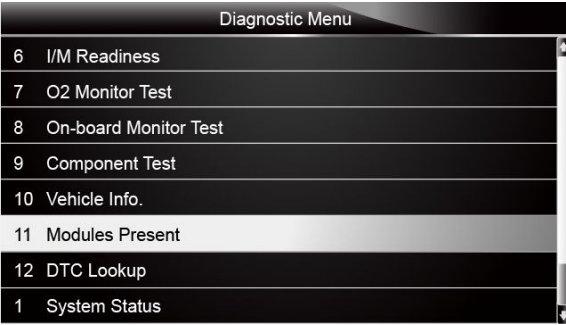


Figure 5-37 Sample Diagnostic Menu Screen

2. A screen with the module IDs and protocols displays.

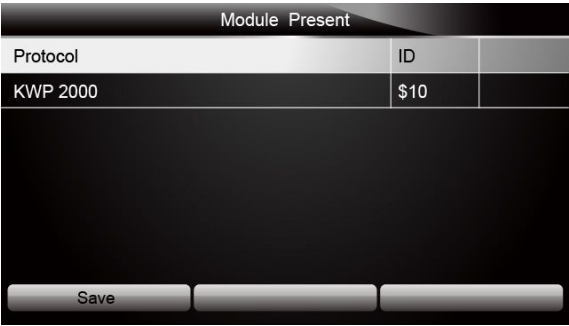


Figure 5-38 Sample Module Present Screen

3. Press function key **Save** to store the readiness data. Or use the BACK key to exit and return.

5.12 DTC Lookup

DTC Lookup menus allows to request DTC definitions stored in the scan tool.



To Look up DTCs:

1. Scroll with the arrow keys to highlight **DTC Lookup.** from Diagnostic Menu and press the **ENTER** key.

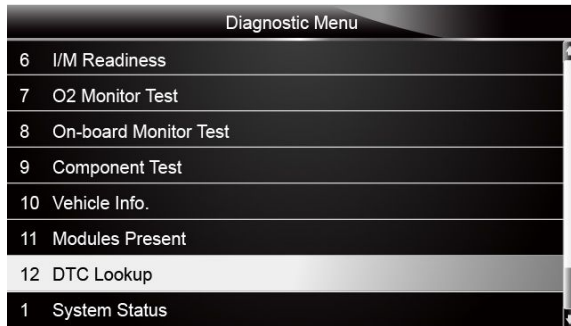


Figure 5-39 Sample Diagnostic Menu Screen

2. Enter a valid code number and press the function key **Finish**.



Figure 5-40 Sample DTC Lookup Screen

3. A screen with code number and its definition displays. If definition could not be found (SAE or Manufacturer Specific), the scanner displays "DTC definition not found! Please refer to vehicle service manual!" If a P1xxx, C1xxx, B1xxx or U1xxx code is entered, select a vehicle make to look for DTC definitions. Press the **Back** key to exit.

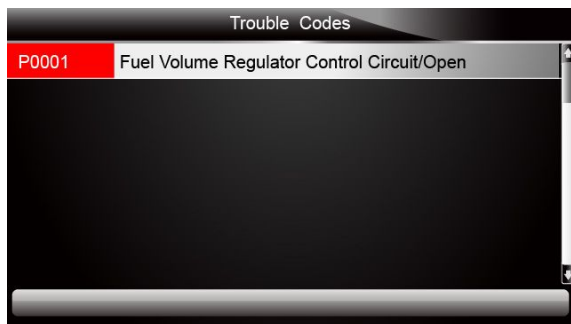


Figure 5-41 Sample Trouble Codes Screen

6 Playback Data

The PlayBack option leads to screens for review of recorded test results.



To review recorded data:

1. Scroll with the arrow keys to highlight **PlayBack** from home screen and press the **ENTER** key.



Figure 6-1 Sample Home Screen

2. A screen with a list of test records displays. If no data is recorded, the message “No Data available!” is displayed.

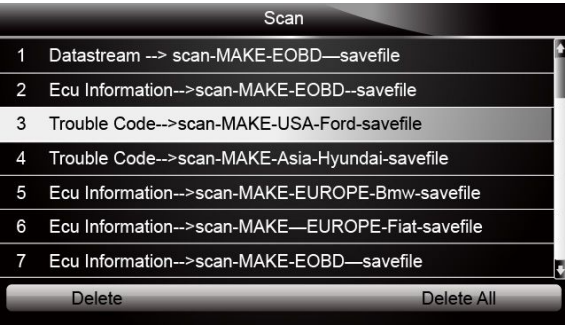


Figure 6-2 Sample Playback Screen

3. Scroll with the arrow keys to highlight a vehicle record and press the **ENTER** key. Details of the test record displays. Use the up and down arrow keys to scroll through data to select lines.

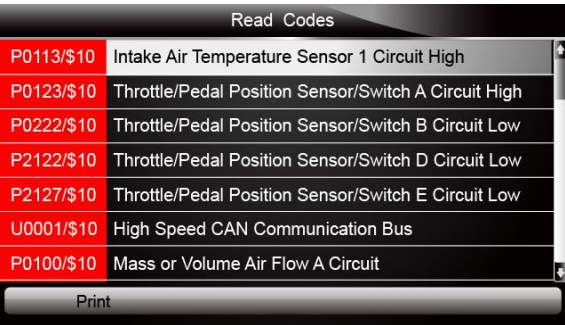


Figure 6-3 Sample Test Data Details Screen

- If you are reviewing live data or freeze frame data, use the function key **Next Frame** or **Pre. Frame** to scroll through all possible frames when necessary.

1 of 4 Frame		
Numbers of DTCs	0	
Fuel system 1 status	--	
Fuel System 2 status	--	
Calculated Load Value	0.0	%
Engine Coolant Temperature	10	°F
Short Term Fuel Trim-Bank 1	0.0	%
<div>Pre.Frame Print NextFrame</div>		

Figure 6-4 Sample Test Data Details Screen

- To erase a record, scroll with the arrow keys to highlight it and press the function key **Delete**. To delete all records, press the function key **Delete All**. Answer **Yes** to delete and **No** to quit.

7 System Setup

This section illustrates how to program the scanner to meet your specific needs.

When Setup application is selected, a menu with available service options displays. Menu options typically include:

- Language
- Unit
- Beep Set
- Key Test
- LCD Test
- About
- Shortcuts

7.1 Select Language

Selecting Language opens a screen that allows you to choose system language. The scan tool is set to display English menus by default.

- ▶ To configure system language:
- Scroll with the arrow keys to highlight **Language** from Setup menu and press the **ENTER** key.



Figure 7-1 Sample Setup Screen

2. Press the **LEFT/RIGHT** arrow key select a language and press the **ENTER** key to confirm.
Press the **Back** key to exit and return.



Figure 7-2 Sample Language Selection Screen

7.2 Change Units

Selecting Unit opens a dialog box that allows you to choose between US customary or metric units of measure.



To change the unit setup:

1. Scroll with the arrow keys to highlight **Units** from Setup menu and press the **ENTER** key.



Figure 7-3 Sample Setup Screen

2. Press the **LEFT/RIGHT** arrow key select an item and press the **ENTER** key to save and return.

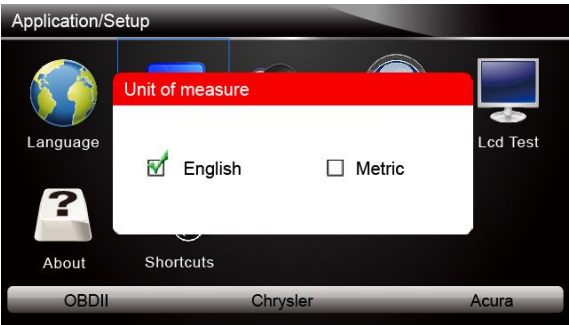


Figure 7-4 Sample Language Selection Screen

7.3 Configure Beeper

Selecting Beep Set opens a dialog box that allows you to turn on/off the beeper.

- ▶ To turn on/off the beeper:
1. Scroll with the arrow keys to highlight **Beep Set** from Setup menu and press the **ENTER** key.



Figure 7-5 Sample Setup Screen

2. Press the **LEFT/RIGHT** arrow key select an item and press the **ENTER** key to save and return.

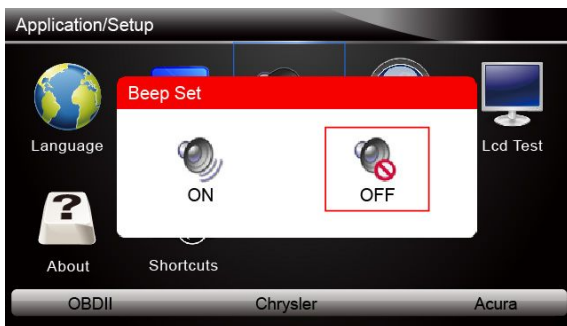


Figure 7-6 Sample Beeper On/Off Selection Screen

7.4 Test Keypad

Selecting Key Test option opens a screen that allows you to check the functionality of the keypad.

- ▶ To test the keypad:
1. Scroll with the arrow keys to highlight **Key Test** from Setup menu and press the **ENTER** key.



Figure7-7 Sample Setup Screen

2. Press any key to start test. The virtue key corresponding with the key you pressed will be highlighted on the screen if it works correctly.



Figure 7-8 Sample Key Test Screen

3. To quit the test, click the F2 function key twice.

7.5 LCD Keypad

Selecting LCD Test option opens a screen that allows you to check the functionality of the display.

- ▶ To test the display:
1. Scroll with the arrow keys to highlight **LCD Test** from Setup menu and press the **ENTER** key to start test. Check if there are any missing spots in the LCD screen.



Figure 7-9 Sample LCD Test Screen

2. To quit the test, press the **Back** key.

7.6 Tool Information

Selecting About option opens a screen that show information about your scan tool, such as serial number and register password which may be required for product registration.



To view information of your scan tool:

1. Scroll with the arrow keys to highlight **About** from Setup menu and press the **ENTER** key.



Figure 7-10 Sample Setup screen

2. A screen with detailed information of the scanner displays.



Figure 7-11 Sample Tool Information Screen

3. Press the **Back** key to exit and return to the Setup menu.

7.7 Configure Shortcut Keys

Selecting Shortcuts option lets you to change the functionality of the shortcut buttons.



To assign a function to a shortcut button:

1. Scroll with the arrow keys to highlight **Shortcuts** from Setup menu and press the **ENTER** key.
A screen with available shortcut keys displays.



Figure 7-12 Sample Setup screen

2. Press the **UP/DOWN** arrow key select an shortcut key and press the **ENTER** key. A screen with a list of loaded applications displays.

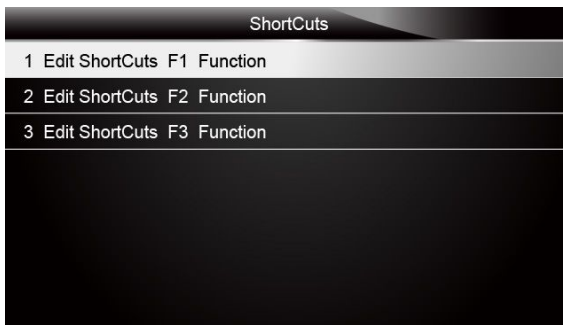


Figure 7-13 Sample ShortCuts Screen

3. Scroll with the **UP/DOWN** arrow keys to highlight an application and press the **ENTER** key to assign the application to the shortcut key.
4. Press any key to exit and return.